IJERLAS
International Journal of Educational Review, Law And Social Sciences

THE ILLEGAL TRADING (RED MARKET) OF MEDICINAL PLANTS IN SOUTH AFRICAN RURAL AREAS: A SCOPING REVIEW

Witness Maluleke[1], Nyiko Faith Shibambu[2]
[1,2] University of Limpopo
Corresponding Email : witness.maluleke@ul.ac.za[1], nyikofaith20@gmail.com[2]

Abstract

The widespread of illegal trading (Red market) of medicinal plants has reached a concerning phase in South Africa rural areas. This prohibited practice involves a global black market for instant monetary gain, usually committed by illegal collections and sales of these plants, fuelling their scarcity. Therefore, the objective of this study was to explore the illegal trading of medicinal plants in South African rural areas. This qualitative scoping review was supported by the 2005 adapted version of the methodology framework by Arksey, Hilary & O'Malley, Lisa of 2005 to search for relevant studies from notable databases and internet sources, focusing on South African rural areas and other international countries, optionally. The Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) will be used for data analysis, supported by the inductive Thematic Content Analysis (TCA).The findings of this study present that the illegal trading of medicinal plants is on the rise in South African rural areas owing to the illegal trading, with the potential criminals reportedly less likely to face consequences of their ill actions and the greatest factor of their scarcity is attributed to this practice, with less efforts offered for greater adequate attention geared towards conservation and safeguarding of these vulnerable plants. It is concluded and recommended that the chain of events of illegal trading should be established closely looking at a period when this illegal action is committed, reported to the selected relevant stakeholders, such as the 'African National Healers Association (ANHA), Department of Correctional Services (DCS), Department of Justice and Constitutional Development (DoJ & CD), PlantZAfrica, South African Local Government Association (SALGA), South African National Biodiversity Institute (SANBI), South African Police Service (SAPS), who are responsible for the investigation, prosecution, incarceration and rehabilitation of suspected and convicted criminals. Moreover, effective deterrents to this criminality should be further researched to broaden access to justice and strengthen prevention, combating and investigative initiatives by relevant stakeholders in the local government sphere, where towns and surrounding rural areas are going to be accountable for the protection and preservation of heritage.

Keywords: *Illegal trading, Medicinal plants, Red market, Rural areas, Scoping review, South Africa*

1. INTRODUCTION

The widespread of illegal trading (Red market) of medicinal plants has reached a concerning phase in South Africa's rural areas. This prohibited practice involves a global black market for instant monetary gain, usually committed by illegal collections and sales of these plants, fuelling their scarcity. Despite the availability and accessibility of Western medicine in the 21st century, a wide range of cultural communities in South Africa still depend on and often prefer traditional medicine (TM) or '*muthi'* as an important component of primary health care (Williams *et al*., 2013). It is estimated that 70–80% of people worldwide rely chiefly on traditional, largely herbal, medicine to meet their primary healthcare needs (Wodah & Asase, 2012). The global demand for herbal medicine is not only large but growing (Srivastava *et al*., 2020). The market for traditional medicines is estimated to be expanding at 20% annually (Subrat *et al.*, 2002). Factors contributing to the growth in demand for traditional medicine include the increasing human population and the frequently inadequate provision of Western (allopathic) medicine in developing countries (Hamilton, 2004). In South Africa, ratio of doctors (practicing Western medicine) to patients is about 1:1639 (overall) and

1:17 400 (homeland areas) and traditional medical practitioners (TMPs) (practicing largely plant-based medicine) to patients is about 1:700–1200 (Hamilton, 2004). Traditional healers rely on medicinal plants for their treatments. Around 27,000 tons of medicinal plants worth 1 billion rands are collected from the wild each year in South Africa (Omogbadegun *et al*., 2011). Of this plant material, about 70% is used by traditional healers, three-quarters of which is harvested from the wild.

This places a great burden on natural plant resources since it is generally held that only about 30% of the plant material should be taken, leaving enough for the plant to regenerate, and this is assuming that there is an abundant supply of the said plant (Omogbadegun *et al*., 2011). In some areas, plants are over-harvested and sold in the illegal market to such an extent that they have become locally extinct (Omogbadegun *et al*., 2011). This has forced traditional healers to collect rarer and more vulnerable plants, sometimes committing theft on private land and even poaching in protected areas (Omogbadegun *et al*., 2011). Some concerns exist surrounding the availability of medicinal plants, for a large part, because most species of medicinal plants are collected from the wild (Hamilton, 2004). The total number of species of medicinal plants cultivated on any scale is few, although this does include some species of MAPs that are traded internationally in large volumes, as well as many of the (small) number of species used as starting points for pharmaceutical drugs.

There are medicinal plants that are being sold in the red market and this imposes a threat to the availability of the existing plants (Hamilton, 2004). Men were the predominant traders of traditional medicine in the red markets, and 90% of the respondents reported that they derived more than 50% of their households' income from illegally selling medicinal plants (Meke, Mumba, Bwanali & Williams, 2016). Approximately 123 plant species were recorded during the survey and based on frequencies, the most common species sold were: Cassia abbreviata (77% of traders), *Cissus cornifolia* and *Aristolochia hockii* (47% each), Zanha *Africana* (37%) and *Afzelia quanzensis*, *Combretum zeyheri* and *Dicoma amoena* (30% each) (Meke *et al*., 2016). Sixty-eight percent of the identified species were sold for roots, and 44% for bark (Meke *et al*., 2016). It also emerged that at least 26 species (24%) were being exported to southern Africa, including *Mondia whitei* (An Endangered species in South Africa), and that at least 73% of the respondents had sold plants to South Africa (Meke *et al*., 2016).

Illegal occupation in the traditional herbal medicine market and theft of medicinal plants drastically affect their availability, as some of the local illegal traders seem to be lacking adequate conservation methods to minimise unfortunate current depletions (Shibambu, 2023). Notable studies on illegal occupation and theft of these plants strongly indicate that their trading can endanger these plants, leading to extinction (Shibambu, 2023). Approximately 525 tonnes of plant material, comprising at least 166 taxa and valued at approximately R27 million per annum, was traded annually in the study area alone. Individual species fetch prices as high as R68 per kg and are extremely valuable (Dold, 2002). The medicinal plant trade not only provides vital welfare for millions of consumers, but it is also critical for the welfare of all the people engaged in the industry (Mander, 1998)

2. IDENTIFYING RELEVANT LITERATURE STUDIES

2.1 Identifying research question

To develop a research question, Muka *et al.* (2020) advise researchers to draw down the research aim of the study. If the research aim is not clear, then the research question will not be offering researchers an opportunity to build the search strategy. In this review, the study aimed to 'explore the danger imposed to availability of indigenous plants due illegal trading (Red market) in South Africa' Stemming from the aim of this review, this scoping review aims to address the following broad research question: What are the dangers imposed to the availability of medicinal plants due to illegal trading in South African? Furthermore, another two (2) specific research questions that were addressed by this review were as follows:

1. What are the factors that contribute to the illegal trading of medicinal plants in South Africa?

2. What kind of publications and findings are shared by governmental publications, official reports, internet sources/online media platforms, journal articles, Dissertation, Thesis, books, chapters in a book, and newspapers on the illegal trading of medicinal plants in South Africa? as section 2.2 of this study refers in addition.

2.2 Identifying relevant studies

The researchers relied on different sites to source relevant literature studies on this subject, these are: Google, Google Scholar, EbcoHost, Emerald Insight, Jstor, Internet sources, ProQuest, Sabinet, Sage Online, and Science Direct, amongst other reputable databases in the field of Social Sciences nor Humanities.' The conducted searches were restricted from 2001-2023 [Not in sequence], focusing on inclusion and exclusion criteria and the use of keywords to arrive at 34 selected notable relevant studies. The inclusion criteria were articles published in accredited academic journals articles, Dissertations, Thesis, government publications, official reports, online Newspapers, published books, and book chapters. For the exclusion, all reviewed publications that were not published by sought-after media houses and published in peer-reviewed accredited publications were omitted to ensure the trustworthiness of the reviewed data. Importantly, the keywords extracted from the research topic were used as guidelines for this review and the researchers did not specify which research approach or the country of the cited published research works to get a wider range of relevant information on this subject.

2.3 Study selections

Apart from the above-mentioned study inclusion and exclusion criteria, the researchers had to ensure that they select relevant publications on this subject, to form part of this review, while adopting the PRISMA (Refer Figure 1).

2.4 Data charting and summarising

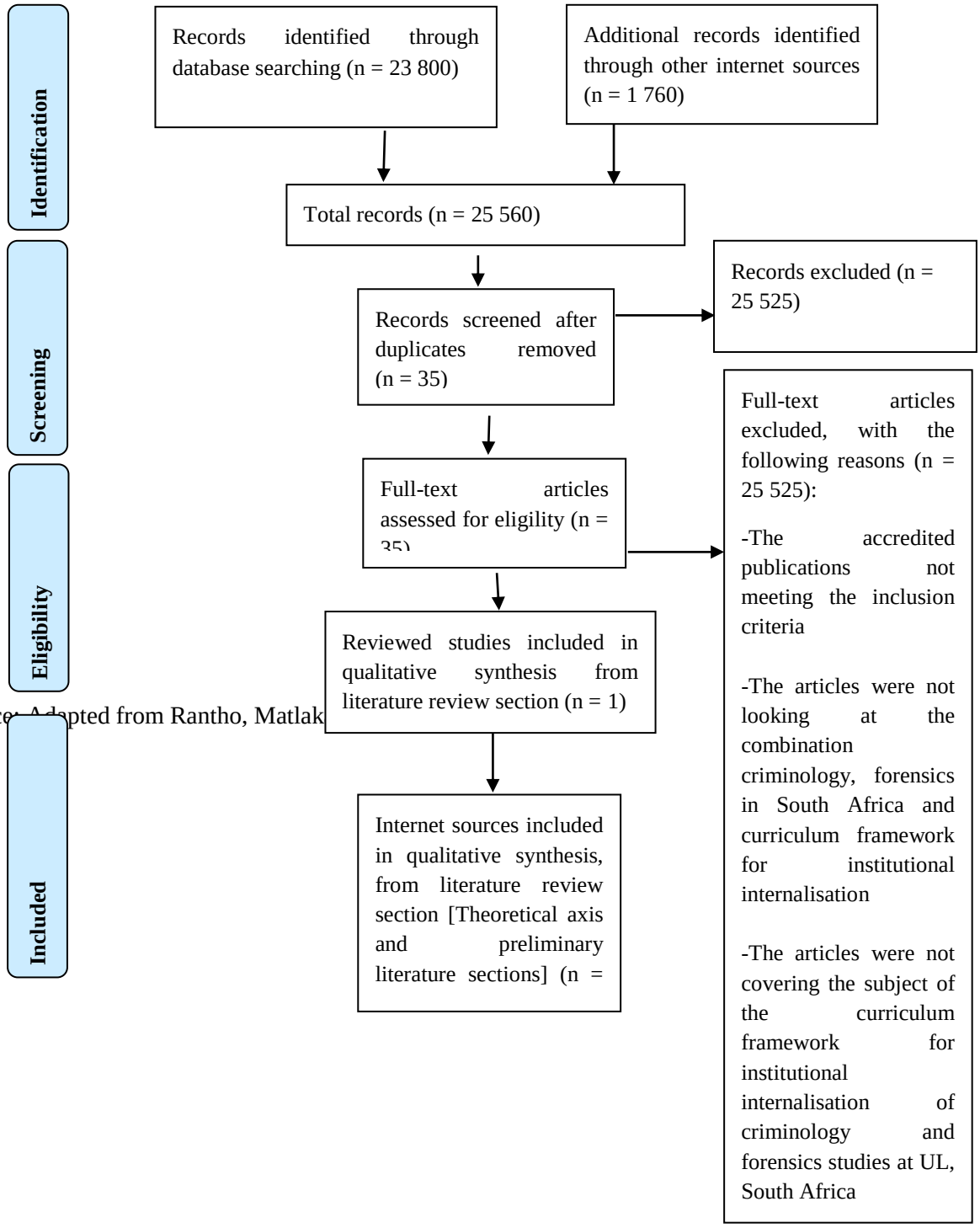
The researchers relied on data charting to extract the selected data from the PRISMA (Refer to Table 1). Data charting looked at the responsible authors, years of publication, title of publications topic, adopted methodology or type of publications, and findings. The collected data were summarised using the PRISMA to ensure the trustworthiness of the findings of this review. This scoping review [Also regarded as the non-empirical research design: Systematic review] explores the illegal trading of medicinal plants in South African rural areas (Dan, 2017, Maluleke, 2020). The key concepts stemming from the topic of this review were used, with the main sources on this subject largely considered. It is provided that the relevant sources to a particular subject can be used as stand-alone study project, more especially in complex research areas or research subject comprehensively reviewed in the past Mays, Roberts and Popay (2001).

The PRISMA was employed to identify, evaluate and summarise the findings of this review, focusing on reviewed literature studies to making available evidence more accessible to decision-makers, by offering suitable recommendations (Bwanga, 2020). Furthermore, to develop understanding and obtain relevant information on this subject, the collected data stemmed from relevant databases, as initially illustrated were visited to retrieve suitable studies, using the non-probability: purposive sampling, while restricting the collected data to 1901-2023, resulting in search results, not in order of importance and sequence, Maluleke (2020), and Mokwena and Maluleke (2020). To achieve the exclusion and exclusion criteria of this study, a total of 25 560 articles were retrieved from the selected databases [23,800, under 0.36 second searches] and internet sources [1 760 with 0.50 seconds].

However, only 34 studies, involving, journal articles, Newspapers, governmental and official reports, chapters in a book, books, dissertations, and Thesis, as well as internet sources, and databases indicated in section 2.2 of this study were reviewed. In addition, the researchers opted for a scoping review because the issue of exploring the illegal trading of medicinal plants in South African rural areas is not a new phenomenon and a plethora of literature studies exist on this subject. This review was guided by 'Arksey and O'Malley (2005) proposed a framework on processes for conducting

scoping reviews' consisting of Five (05) stages; namely, 1) Identifying the research question, 2) Identifying the relevant studies, 3) Study selection, 4) Data charting, and 5) Summarising data. This framework was deemed relevant for conducting this scoping review and stages 4 and 5 were combined for the purpose of this study. The PRISMA was employed to ensure the trustworthiness of the study findings, relating to the raised research questions of this review.

Figure 1: The PRISMA - Flow chart of study selection



Source: Adapted from Rantho, Matlak

Table 01: Data charting and summarising

Author (s)	Year	Title of publication	Adopted Methodology or type of publication	Findings
Shibambu, N.F	2024	The effects of urbanisation on the availability of medicinal plants at Malamulele area, Limpopo Province, South Africa	Qualitative	Medicinal plants are important to humanity and continue to be used worldwide as a source of food and basic healthcare. However, most of them are under threat of extinction. This was prompted by several negative factors contributing to the extinction of these [Medicinal] plants. These factors are, among others, demarcated to habitat loss, population increase, urbanisation, theft, threats brought by climatic change and illegal trading (Red market)
Shibambu, N.F & Maluleke, W	2023	Conservation and theft of endangered plants in South African rural communities: A Review of Literature	Accredited journal (Pakistan Journal of Criminology)	The findings of this study discovered that the indigenous plants from selected rural communities are endangered by human activities. These human activities are, among others, theft, limited to 'illegal harvesting and theft of endangered indigenous plants, invading the boundaries and limited knowledge about conservation.' Therefore, rural communities are taking intervention measures to ensure that these plants are protected and do not become extinct due to theft and illegal harvesting
Shibambu, N.F & Maluleke, W	2023	A Review Study on Alternative Conservation and Management Methods to Sustain Medicinal Plants in South Africa	Accredited journal (E-Journal of Humanities, Arts and Social Sciences - EHASS)	The results of this study reveal that there are various conservation methods that are implemented as strategies to safeguard the existing medicinal plants from illegal trading (Red market) and this proves if these methods are implemented correctly these plants will still be available for future use. It is concluded and recommended that the demand for medicinal plants imposes huge threats to their anticipated availabilities, therefore, the relevant stakeholders need to take urgent corrective measures concerned parties should be consistently exposed to improved resources, advanced training and better

				education about the benefits and importance of these plants.
Shibambu, N.F	2023	A review study on alternative management methods to sustain medicinal plants in South Africa	Social Sciences International Research Conference (SSIRC) Proceedings	Similar to the findings of the study conducted by Shibambu, N.F & Maluleke, W (2023), the multiple management methods are often implemented as strategies to safeguard the existing medicinal plants, and the sustainability of these methods are heavily dependent to the correct implementations' methods for a possible preservation for future use
Maluleke, W & Shibambu, N.F	2021	Exploring illegal harvesting and theft of the selected South African endangered indigenous plants on the Red data list: Case studies of rural areas	Accredited journal (ADRRI Journal of Arts and Social Sciences)	The indigenous endangered red list data plants are negatively affected by illegal harvesting and theft across South African rural areas. Moreover, it was also evident that limited conservation methods of these plants are unfounded or incorrectly implemented, since most of these plants are reported to be scarce, with some of them facing extinctions
Shibambu, N.F	2022	Interpretive study of commercialisation of medicinal plants in South Africa: prospects and challenges	SSIRC Proceedings	This study was to analyse the commercialisation of medicinal plants in South Africa, to identify existing commercialisation prospects and challenges. Notably, these plants can be used for primary health care and food, amongst others. This rationale stemmed from the associated effects imposed by unregulated local traders (*Muthi* shop owners, street vendors and suppliers) selling medicinal plants.
Shibambu, N.F, Malatji, M.K & Maluleke, W	2022	The effects of urbanisation on the availability of medicinal plants (red data species) in the Malamulele area of Limpopo Province, South Africa	SSIRC Proceedings	The findings of this study indicates that the availability of medicinal plants in the study area are threatened by illegal trading (Red market). The data that was collected indicates that all the participants hold the view that urbanisation poses a great threat to the survival of indigenous medical plants. Furthermore, they contend that available conservation methods to prevent indigenous medical plants from possible extinctions are either not implemented properly or are neglected. Therefore, the discovered

				rapid loss of these plants might affect future preservations and protections. The expansion of the Malamulele inner city due to urbanisation contributes to the witnessed decreases of natural resources (Medicinal plants included).
Shibambu, N.F, Malatji, M.K & Maluleke, W	2021	A Systematic Analysis of strategic management methods for conservation of Medicinal Plants in South African rural communities	Accredited journal (European Journal of Economics, Law and Social Sciences)	This study established that medicinal plants in rural South African communities are mostly affected by urbanisation practices and illegal trading (Red market). It was also evident that few strategic of protecting and preserving medicinal plants are currently ineffective despite the conventional importance of these plants
National Oceanic and Atmospheric Administration (NOAA)	2016	Illegal, unreported, and unregulated (IUU) fishing.	Internet source (NOAA)	Illegal Wildlife Trade (IWT) targets thousands of species of terrestrial and marine animals, plants, and fungi worldwide, with cascading impacts on the environment, livelihoods, food security, national security, and sustainable development.
Phelps, J., Biggs, D & Webb, E.L	2016	Tools and terms for understanding IWT	Accredited Journal (Frontiers in Ecology and the Environment)	IWT is a global conservation issue that threatens thousands of species, including fish, fungi, medicinal plants, and charismatic mammals.
Phelps, J., Biggs, D., & Webb, E.L.	2016	Tools and terms for understanding IWT	Accredited Journal (Frontiers in Ecology and the Environment)	IWT involves a range of actors in harvest, trade, and use dimensions.
Wodah, D & Asase, A	2012	Ethnopharmacological use of plants by Sisala traditional healers in northwest Ghana.	Journal (Pharmaceutical Biology)	It is estimated that 70–80% of people worldwide rely chiefly on traditional, largely herbal, medicine to meet their primary healthcare needs
Hamilton, A.C	2024	Medicinal plants, conservation, and livelihoods	Accredited journal (Biodiversity and Conservation)	Factors contributing to the growth in demand for traditional medicine include the increasing human population and the frequently inadequate provision of Western (allopathic) medicine in developing countries
Mander, M	1998	Marketing of		The current demand for numerous

		Indigenous Medicinal Plants in South Africa. A Case Study in KwaZulu-Natal.		popular plant species used for indigenous medicines exceeds supply. To date, several plant species, such as wild ginger (*Siphollochilus aethiopicus*) and the pepper bark tree (*Warburgia salutaris*) have become extinct outside of protected areas
Moeng, E.T & Potgieter, M.J	2011	The trade of medicinal plants by *muthi* shops and street vendors in the Limpopo Province, South Africa.	Accredited Journal (*Journal of Medicinal Plants Research)*	The major quantities of indigenous medicinal plants, which were traded mainly in provincial informal markets, are harvested from wild populations. Medicinal plants are harvested from a wide range of habitats in the province, including threatened grassland, savanna woodlands, and riparian vegetation. 13% of traders are currently using different plant parts than before, due to a shortage of preferred parts. Preferred medicinal plants that are becoming difficult to obtain in South Africa are imported from neighboring countries like Swaziland, Mozambique, and Zimbabwe
Williams, V. L., Victor, J.E & Crouch, N.R	2013	Red listed medicinal plants of South Africa: status, trends, and assessment challenges.	Accredited Journal *(South African Journal of Botany)*	Fifty percent or more of the medicinal plants within each threatened category or category of conservation concern have been recorded in the *muthi* markets, especially the Declining (94%), Near Threatened (81%) and Vulnerable (74%) medicinal plants; furthermore, 68% of the 82 threatened medicinal species are traded.
Lavorgna, A & Sajeva, M	2021	Studying illegal online trades in plants: market characteristics, organisational and behavioural aspects, and policing challenges.	Accredited Journal (*European Journal on Criminal Policy and Research*)	Illegal commerce in plants and their derivatives threatens and destroys numerous species and important natural resources and may cause phytosanitary and health problems. This illegal trade, which has been boosted by the commercialisation of the Internet, has been relatively overlooked in criminological research problems. Furthermore, the policing of illegal plant markets remains limited and poorly resourced, with law enforcement

				agencies lacking awareness and technical capacity in investigation and prosecution services problems.
Kaminski, K., Beckers, F & Unger	2012	Global internet trade of plants–legality and risks.	Journal *(EPPO bulletin)*	It has been recognized that the illegal plant trade threatens and destroys numerous species and important natural resources and can cause phytosanitary risks
United Nations Office on Drugs and Crime (UNODC)	2016	World Wildlife Crime Report. Trafficking in protected species.	Internet source (UNODC)	Moreover, this type of illegal trade can hinder the rule of law, security, and good governance
Rasethe, M. T., Semenya, S. S., & Maroyi, A	2019	Medicinal plants traded in informal herbal medicine markets of the Limpopo Province, South Africa.	Accredited (Evidence-Based Complementary and Alternative Medicine)	A total of 150 medicinal plant products representing at least 79 plant species belonging to 45 botanical families, mainly the Fabaceae (11.4%), Asteraceae (7.6%), and Hyacinthaceae (6.3%), were traded in the study area. Roots (50.0%), bulbs (19.0%), and bark (16.0%) were the most frequently sold plant parts. Some of the traded species which include *Alepidea amatymbica*, *Bowiea volubilis*, *Brackenridgea zanguebarica*, *Clivia caulescens*, *Dioscorea sylvatica*, *Elaeodendron transvaalense*, Encephalartos woodii, *Eucomis pallidiflora* subsp. *Poleevansii*, Mer willa plumbea, *Mondia whitei*, *Prunus africana*, *Siphonochilus aethiopicus*, *Synaptolepis oliveriana*, and *Warburgia salutaris* are of conservation concern and listed on the South African Red Data List.

Source: Researcher's illustrations (2024)

4. STUDY FINDINGS AND DISCUSSIONS

Emanating from the introduction and the reviewed literature studies on this subject (The illegal trading (Red market) of medicinal plants in South African rural areas), under Table 01. In reference to section 2.4, under Table 1 of this study, it was confirmed by Shibambu (2024) MA: Anthropology study that the medicinal plants play important roles to humanity, with proven worldwide value, it is a source of food and basic healthcare. Negatively, many of them are under severe threat of extinctions due to habitat loss, population increase, urbanisation, theft, threats brought by climatic change and illegal trading (Red market). Shibambu and Maluleke (2023) collectively shared that the indigenous plants from selected rural communities are endangered by various human activities, such as 'illegal harvesting and theft of endangered indigenous plants. Shibambu and Maluleke (2023), and Shibambu (2023) went on to reveal that multiple conservation methods are

implemented as strategies to safeguard the existing medicinal plants from illegal trading (Red market) in South African rural areas and their sustainability will ensure availability of medicinal plants for future use.

Equally, Maluleke and Shibambu (2021) provided that the indigenous endangered red list data plants are negatively affected by illegal harvesting and theft across South African rural areas, strongly affected by limited conservation methods based on effectiveness. Positively, Shibambu (2022) revealed that the medicinal plants are commercialised in South Africa, with rural areas included, these plants can be used for primary health care and food, however, the unregulated local traders, especially Muthi shop owners, street vendors and suppliers are selling them, this also reads with Shibambu (2024) MA: Anthropology study. Moreover, Shibambu, Malatji and Maluleke (2022) also identified that the availability of medicinal plants in South African rural areas are often touted to be threatened by illegal trading (Red market), this also reads with the findings of Shibambu (2024) MA: Anthropology study. Shibambu, Malatji and Maluleke (2021) established that medicinal plants in rural South African communities are mostly affected by urbanisation practices and illegal trading (Red market).

4.1 The contributing factors to the illegal trading of medicinal plants in South Africa

According to Hamilton (2004) in section 1 of this study presented that factors contributing to the growth in demand for traditional medicine include the increasing human population and the frequently inadequate provision of Western (allopathic) medicine in developing countries. It is estimated that 70–80% of people worldwide rely chiefly on traditional, largely herbal, medicine to meet their primary healthcare needs as stated by Wodah & Asase (2012). Moreover, Mander (1998) in section 1 of this argued that in South Africa, there are long-standing traditions for the gathering and processing of medicinal plants for the markets. Mander (1998) further stated in section 2.4 of this study that increasing interest in traditional medicines has, however, boosted the gathering activities from natural sources to an alarming level The current demand for numerous popular plant species used for indigenous medicines exceeds supply. To date, several plant species, such as wild ginger (*Siphollochilus aethiopicus*) and the pepper bark tree (*Warburgia salutaris*) have become extinct outside of protected areas (Mander, 1998).

Furthermore, Moeng and Potgieter (2011) presented that in section 1 of this study, the major quantities of indigenous medicinal plants, which were traded mainly in provincial informal markets, are harvested from wild populations. They (Moeng & Potgieter, 2011) continue state that medicinal plants are harvested from a wide range of habitats in the province, including threatened grassland, savanna woodlands and riparian vegetation. The supply of important medicinal plants has declined leading to concerns by 81% of traders and all environmental enforcement officers. 44% of traders were using smaller-sized parts than before, due to a shortage of normal-sized plants in the wild as stated by Moeng and Potgieter (2011) in section 2.4 of this study. Moeng and Potgieter (2011) further revealed that about 201113% of traders are currently using different plant parts than before, due to a shortage of preferred parts.

Preferred medicinal plants that are becoming difficult to obtain in the South Africa are imported from neighbouring countries like Swaziland, Mozambique and Zimbabwe. About fifty percent or more of the medicinal plants within each threatened category or category of conservation concern have been recorded in the *Muthi* markets, especially the Declining (94%), Near threatened (81%) and vulnerable (74%) medicinal plants; furthermore, 68% of the 82 threatened medicinal species are traded as presented by Williams *et al*., (2013) in section 1 of this study. Hence, traded species are more threatened than non-traded species and persistent commercial exploitation could result in the future upgrading of the Red List statuses of several species that are currently at risk as Williams *et al*., (2013) continued. Similarly, trading in medicinal plants also serves as a valuable source of income for several households in different provinces of South Africa.

4.2 Dangers imposed to availability of indigenous plants due illegal trading (Red market) in South African rural areas

Lavorgna and Sajeva (2021) in section 2.4 of this study stated that illegal commerce in plants and their derivatives threatens and destroys numerous species and important natural resources and may cause phytosanitary and health problems. Moreover, this illegal trade, which has been boosted by the commercialisation of the Internet, has been relatively overlooked in criminological research problems as presented by Lavorgna and Sajeva (2021) in section 2.4. Furthermore, the policing of illegal plant markets remains limited and poorly resourced, with law enforcement agencies lacking awareness and technical capacity in investigation and prosecution services problems (Lavorgna & Sajeva, 2021). Furthermore, Hinsley & Roberts (2018) concurred in section 2.4 of this study that plant crime is a major environmental problem that over the years has received attention around conservation science.

It has been recognised by Kaminski *et al.* (2012) and Phelps and Webb (2015) in section 2.4 of this study that the illegal plant trade threatens and destroys numerous species and important natural resources and can cause phytosanitary risks. Moreover, is also stated by UNODC (2016) in section 2.4 of this study that this type of illegal trade can hinder the rule of law, security, and good governance, fostering 'environmental insecurity' (A term used in global environmental high politics to stress how the global illicit wildlife trade is both a source and outcome of biodiversity declines and social conflict problems as supported by Lavorgna & Sajeva (2021) in section 2.4 of this study. The bulk of the trade in medicinal plant products takes place at the informal street markets and involves the sale of relatively large quantities of unprocessed or semi-processed products, in reference to Table 02.

Table 02: List of plants recorded in informal herbal medicine markets in South Africa

Family	Scientific name	Habit Tree	Conservation status	Part used	Medicinal uses	Frequency (%)
Acanthaceae	Sclerochiton ilicifolius A. Meeuse	Tree	LC	Roots	Hypertension and malaria	28.6
Amaryllidaceae	Clivia caulescens R.A. Dyer	Herb	NT	Roots	Police evasion	54.3
Amaryllidaceae	Boophone disticha (L.f.) Herb.	Herb	LC	Bulb	Cancer, diabetes mellitus and kidney problem	25.7
Amaryllidaceae	Ammocharis coranica (Ker Gawl.) Herb.	Herb	LC	Bulb	Hypertension and blood cancer	25.7
Amaryllidaceae	Ammocharis coranica (Ker Gawl.) Herb.	Herb	DDT	Bulb	Human Immunodeficiency Virus (HIV),	22.9

Source: Rasethe *et al*. (2019)

5. CONCLUSION AND RECOMMENDATIONS

It is concluded that the chain of events of illegal trading should be established closely looking at a period when this illegal action is committed, reported to the selected relevant stakeholders, such as the 'ANHA, DCS, DoJ & CD, PlantZAfrica, SALGA, SANBI, SAPS, who are responsible for investigation, prosecution, incarceration and rehabilitation of suspected and convicted criminals. the main factors exist on how endangered indigenous plants are threatened and subjected to illegal

harvesting and theft through invading the boundaries of protected areas and having easy access to areas where these plants grow or are often found, with the illegal harvesters or collectors and thieves taking advantage of that. Although institutions, such as the Community-Based Natural Resources Management (CBNRM) are touted to protect and preserve South African medicinal plants, this study confirmed that some of these plants are not fully protected.

Furthermore, effective deterrent to this criminality should be further researched to broaden access to justice and strengthen prevention, combating and investigative initiatives by relevant stakeholders in the local government sphere, where town and surrounding rural areas are going to be accountable for the protections and preservations of heritage. Notably, this study can be used as a guideline to possibly equip relevant stakeholders, by creating awareness and consequences of illegal harvesting and theft of endangered indigenous plants and to further instil knowledge about relevance of these plants in our postmodern society. Further research studies can be conducted on this subject to ensure triangulations and transfer the results of this study to other similar settings. This can possibly offer good practices of ensuring that illegal harvesting and theft of endangered indigenous plants are curbed and are protected and preserved in our South African rural areas.

REFERENCES

Arksey, H & O'Malley, L. 2005. Scoping studies: Towards a methodological framework. *International Journal of Social Research Methodology*, 8(1):19-32.

Bwanga, O. 2020. How to conduct a qualitative systematic review to guide evidence-based raise in Radiography? *International Journal of Sciences: Basic and Applied Research*, 52(1): 205-2013.

Dan, V. 2017. *Empirical and non-empirical methods*. Retrieved from: https://www.ls1.ifkw.uni-muenchen.de/personen/wiss_ma/dan_viorela/.

Dold, A.P & Cocks, M.L. 2002. The trade in medicinal plants in the Eastern Cape Province, South Africa. *South African Journal of Science*, 98(11), 589-597.

Hamilton, A.C. 2004. Medicinal plants, conservation and livelihoods. *Biodiversity and Conservation*, 13(8), 1477-1517.

Hinsley, A & Roberts, D. L. 2018. The wild origin dilemma. *Biological Conservation*, 217(1), 203-206.

Kaminski, K., Beckers, F & Unger, J. G. 2012. Global internet trade of plants–legality and risks. *EPPO Bulletin*, 42(2), 171-175.

Lavorgna, A & Sajeva, M. 2021. Studying illegal online trades in plants: market characteristics, organisational and behavioural aspects, and policing challenges. *European Journal on Criminal Policy and Research*, 27(4), 451-470.

Maluleke, W. 2020. The African scare of Fall Armyworm: Are South African farmers immune? *International Journal of Social Sciences and Humanity Studies*, 12 (1), 207-221.

Maluleke, W & Shibambu, N.F. 2021. Exploring illegal harvesting and theft of the selected South African endangered indigenous plants on the Red data list: Case studies of rural areas. *ADRRI Journal of Arts and Social Sciences,* 18, 3(6), 244-295.

Mander, M. 1998. *Marketing of indigenous medicinal plants in South Africa. A case study in KwaZulu-Natal*. Food and Agriculture Organisation: Rome.

Mays, N., Roberts, E & Popay, J. 2001. Synthesising research evidence, In: *Studying the organisation and delivery of health services: Research methods*. Fulop, N, Allen, P., Clarke, A & Black, N (Eds). Routledge: London.

Meke, G.S., Mumba, R.F., Bwanali, R.J & Williams, V.L. 2017. The trade and marketing of traditional medicines in southern and central Malawi. *International Journal of Sustainable Development and World Ecology*, 24(1), 73-87.

Moeng, ET., & Potgieter, M. J. 2011. The trade of medicinal plants by Muthi shops and street vendors in the Limpopo Province, South Africa. *Journal of Medicinal Plants Research*, 5(4), 558-564.

Mokwena, RJ & Maluleke, W. 2020. South African rural communities and the land restitution process: The application of criminological and legal theories in identifying obstacles to nightful allocations of land. *Gender and Behaviour Journal*, 18(3), 16145-16156.

Muka, T., Glisic, M., Milic, J., Verhoog, S., Bohlius, J., Bramer, W., Chowdhury, R & Franco, O.H. 2020. A 24-step guide on how to design, conduct, and successfully publish a systematic review and meta-analysis in medical research. *European journal of Epidemiology*, 35(2), 49-60.

National Oceanic and Atmospheric Administration. 2016. Illegal, unreported, and unregulated (IUU) fishing. www. nmfs.noaa.gov/ia/iuu/iuu_overview.html.

Omogbadegun, Z., Uwadia, C., Ayo, C., Mbarika, V., Omoregbe, N., Otofia, E & Chieze, F. 2011. Multimedia-based medicinal plants sustainability management system. *International Journal of Computer Science Issues*, 8(5), 492-503.

Phelps, J., Biggs, D., & Webb, E. L. 2016. Tools and terms for understanding illegal wildlife trade. *Frontiers in Ecology and the Environment*, 14(9), 479-489.

Rasethe, M.T., Semenya, S.S & Maroyi, A. 2019. *Medicinal plants traded in informal herbal medicine markets of the Limpopo Province, South Africa*. Retrieved from: https://pubmed.ncbi.nlm.nih.gov/31118951/.

Shibambu, N.F. 2023. A review study on alternative management methods to sustain medical plants in South Africa. *Social Sciences International Research Conference Proceedings*, Online 13-15 October, Organised and hosted by the Faculty of Economic and Management Sciences, North-West University, South Africa, e-ISBN number: 978-0-7961-2427-2 (e-book), 300-312.

Shibambu, N.F. 2022. Interpretive study of commercialisation of medicinal plants in South Africa: prospects and challenges. *Social Sciences International Research Conference Proceedings*, Online 19-21 October, organised and hosted by the Faculty of Economic and Management Sciences of the North-West University, South Africa, in partnership with the Open University of Mauritius, e-ISBN number: 978-0-620-96741-9(e-book), 212-223.

Shibambu, NF & Maluleke, W. 2023. A review study on alternative conversation and management methods to sustain medicinal plants in South Africa. *E-Journal of Humanities, Arts and Social Sciences*, 4(8), 1006-1014.

Shibambu, NF., Malatji, M.K & Maluleke, W. 2021. A Systematic Analysis of strategic management methods for conservation of Medicinal Plants in South African rural communities. *European Journal of Economics, Law and Social Sciences*, 5(3), 1006-1025.

Shibambu, NF & Maluleke, W. 2023. Conservation and Theft of Endangered Plants in South African Rural Communities: A Review of Literature. *Pakistan Journal of Criminology*, 15(04), 331-348.

Shibambu, N.F. 2024. The effects of urbanisation on the availability of medicinal plants at Malamulele area, Limpopo Province, South Africa. Unpublished Master of Arts: Anthropology. University of Limpopo: Sovenga.

Shibambu, N.F, Malatji, M.K & Maluleke, W. 2022. The effects of urbanisation on the availability of medicinal plants (Red data species) in the Malamulele area of Limpopo Province, South Africa. *Social Sciences International Research Conference Proceedings*, Online 19-21 October, organised and hosted by the Faculty of Economic and Management Sciences of the North-West University, South Africa, in partnership with the Open University of Mauritius, e-ISBN number: 978-0-620-96741-9(e-book), 585- 598.

Shibambu, N.F. 2023. The selected effects embedded from illegal occupation and theft of medicinal plants: A systematic study on rural areas of Limpopo Province. *International Journal of Social Science Research and Review*, 6(6), 331-342.

Srivastava, P., Singh, M., & Chaturvedi, R (Eds). 2020. Herbal medicine and biotechnology for the benefit of human health, In: *Animal biotechnology*. Academic Press: Beaconvale, Cape Town, 613-629.

Subrat, N., Iyer, M & Prasad, R. 2002. *The ayurvedic medicine industry: Current status and sustainability*. Ecotech Services, London, and International Institute for Environment and Development: New Delhi.

Rantho, K.M, Matlakala, F.K & Maluleke, W. 2023. Psychological challenges of distant parenting on mothers: Scoping review. *Eurasian Journal of Social Sciences*, 11(2), 59-67.

United Nations Office on Drugs and Crime. 2016. *World wildlife crime report: Trafficking in protected species*. The United Nations Office on Drugs and Crime: Vienna.

United Nations Office on Drugs and Crime. 2002. *Results of a pilot survey of forty selected organised criminal groups in Sixteen countries*. Retrieved from: https://www.unodc.org/pdf/crime/ publications/Pilot_survey.pdf.

Williams, V.L., Victor, J.E., & Crouch, N.R. 2013. Red listed medicinal plants of South Africa: status, trends, and assessment challenges. *South African Journal of Botany*, 86(1), 23-35.

Wodah, D & Asase, A. 2012. Ethnopharmacological use of plants by Sisala traditional healers in northwest Ghana. *Pharmaceutical Biology*, 50(7), 807-815.